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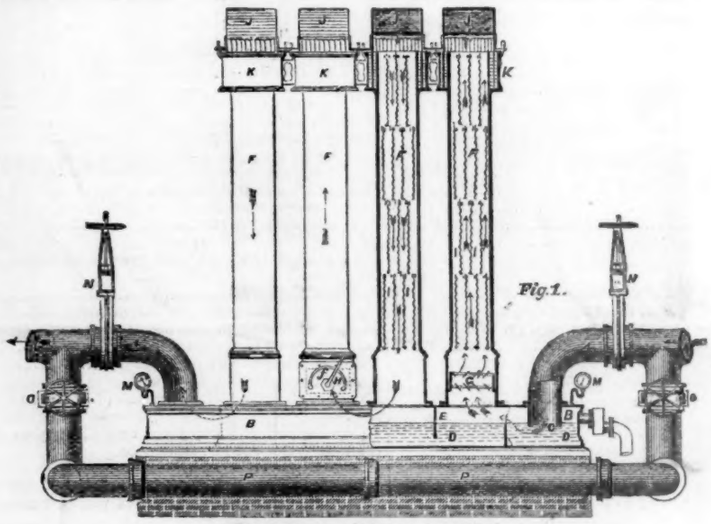

Fig. 1.

FRONT ELEVATION.

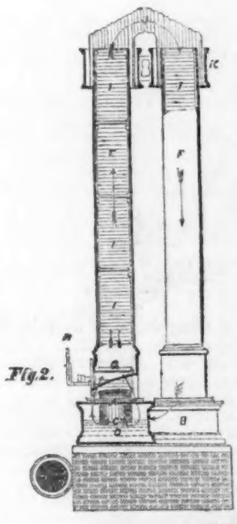

Fig. 2.

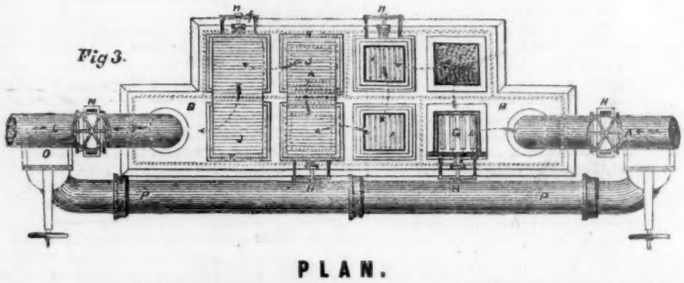

Fig. 3.

PLAN.

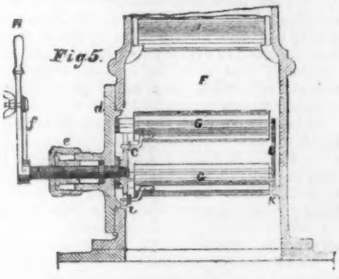

Fig. 5.

ST. JOHN AND ROCKWELL'S PATENT FRICTION CONDENSER OR DRY SCRUBBER.

PATENTED APRIL 4, 1871.

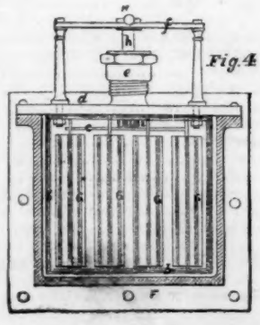

Fig. 4.

The illustration above is a new and improved apparatus for the treatment of gas, after leaving the hydraulic main. The nature of it consists in the introduction of mechanical appliances into a series of pipes, as set forth; reference being had to the letters of explanation marked thereon. We will proceed to describe its construction and operation.

The gas after leaving the hydraulic main, is brought by an ordinary pipe, A, (fig. 1 front elevation to the condenser) where it enters compartment, B, at the end of the tar well, D, and is conducted down to the seal, C, of one-half to three-quarters of an inch, which gives to it the first friction on entering the condenser. The gas being forced through the seal, C, by the exhauster, and after leaving the compartment, B, it enters the

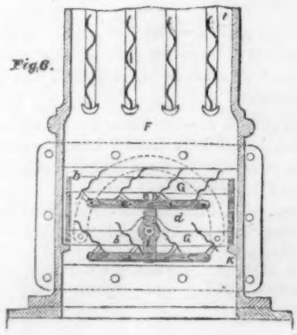

Fig. 6.

first series of the condenser. Its course is there changed by coming in contact with the plate, E, which is sealed in the tar well, D, (fig. 1) and rising in the vertical pipe, F, is passed between the corrugated surfaces of lattice work, G, which being adjustable, is opened and closed at pleasure by the lever, H, to secure the necessary amount of friction desired. The vertical pipes, F, are of a rectangular form, and divided into several compartments, by the introduction in sections of corrugated plates, I. These plates are held in their places by small projections, or brackets, cast on the inside of pipes, F, also in three or four lengths, so as to be easily taken out for any repairs that may be necesssary. The covers, J, are made of corrugated iron, and are fitted into a cup, K, filled with water of a given depth, to correspond with the seals, siphons and cups of the purifiers, etc.; being held in their positions by a strap hinge fastened with a pin, and can be easily removed to clear away any obstructions that may in time occur.

The gas, after passing between the lattice work, G, is again divided into columns by plates, I, and rising in the pipe, F, to the top, is carried across to the opposite pipe, F, by the cover, J, and enters it and descends to the tar well, D. It then moves forward on this same side, until it is brought in contact with a corresponding plate, E, which causes it to enter the pipe, F, and passes between a similar lattice work, G, and corrugated plate, I, ascends to the top of the next cover, J, by which it is brought across to the opposite pipe, F, and again descends to the tar well, D, and so on alternately, until it passess through the whole of the condenser into the main, L, and is conducted to the purifiers.

The lattice work, G, is secured in a frame work, *b*, which is bolted to the bonnet, *d*, and slides into the pipes, F, upon projections or grooves cast on the inside of the pipes, F, and is further supported by a horizontal reversing bar, *h*, which projects through the stuffing box, *e*, so as to receive the handle, H, by which it is moved to the desired position, to secure the amount of friction necessary upon any volume of gas that may be passing, which is determined by the pressure gauges, M, and the graduated arc, *f*, which are at the inlet and outlet of the condenser, and upon the bonnet, *d*. The inner end of the horizontal bar, *b*, is provided with a double arm, *i*, which engages with the upper and lower tier of slats, G, by means of parallel bars, *c*, secured to the pins, which rotate the slats, G. The lattice work, G, is secured to the frame work, *b*, that is bolted to the bonnet, *d*, which is fastened by tap bolts to the vertical pipes, F, and is easily removec for any cleaning or repairs that may be needed; by opening the valves, O, and shutting off the gas from the condenser by the valves, N, and passing it through the by-pass, P, as shown in Fig. 3. It is also located at the base of the pipes, F, in which the gas ascends, which is alternately on each side of the condenser. The lattice work or slats, G. have upon their ends journals or pins, which work in loose sockets, and are moved by the action of the parallel bars, *c*. The bases of the pipes, F, are enlarged in proportion to the room occupied by the lattice work, G, so that their area is maintained. The sections of corrugated plates, I, in the pipes, F, are placed alternately over the intermediate space of the section below, in order to divide the volume of gas into separate columns; thus distributing and securing a greater amount of friction than could possibly occur in any ordinary pipes.

It is claimed that the friction is so arranged, that the same condenser is applicable to any volume of gas, from 50,000 to 5,000,000 cubic feet, more or less, per day, and will arrest all of the tar existing in the volume of gas, without the use of water, and at the same time send forward the gas in a better condition, with all of its volatile and light hydrocarbons, thereby increasing its quantity, and also improving its illuminating power.

We respectfully submit the foregoing to the gas companies of the United States. Further information will be cheerfully given by WILLIAM H. ST. JOHN, New York Gas Works, or S. O. ROCKWELL, 121 Liberty street, New York city.

Gas Items.

ENGLEWOOD, N. J.—The Gas Company is making arrangements to extend its main pipes about two miles down the "Teaneck Road," which is noted for elegant residences.

CARLSTADT, N. J.—Gas works have been established and street lamps have been erected on three of the principal avenues. The gas company proposes to extend its pipes to Rutherford Park.

NEWARK.—The Citizens' Gas-Light Company, which the last Legislature authorized to consolidate with the Orange Company, have nearly completed their arrangements to that end, and will lay the connecting pipe within a week. They also propose to supply Woodside.

Chemical Repertory,

No. 52.—May 2, 1871.

EDITOR—HENRY WURTZ.

[ORIGINAL COMMUNICATION.]

A REPORT ON PETROLEUM-NAPHTHA GAS, TO THE PRESIDENT AND BOARD OF DIRECTORS OF THE FORT WAYNE GAS-LIGHT COMPANY.

By HENRY H. EDGERTON, Superintendent.

[Continued from page 115.]

[From among the voluminous and elaborate notes of Analyses forwarded by Mr. EDGERTON, we select the following, as of great interest and value to Gas Chemists.—H. W.]

COMPOSITION AND CHARACTERISTICS OF PETROLEUM-NAPHTHA GAS, MADE AT MEMPHIS, TENN.

Naphtha Gas coming directly from the Retorts, and before entering the air mixer.

JAN. 26TH, TEST LIGHT BELOW AVERAGE.

SPECIMEN No. 3 : SP. GR. = ·893.

Partial analysis gave carbonic acid	2.2
Illuminating hydrocarbon	25.9
Nitrogen, oxygen, and marsh gas, not separated	71.9
	100.0
Same specimen, gas employed	610.02
After absorbing oxygen	584.80
	25.22
Oxygen and nitrogen, assuming them to be in same proportion as in air	19.72 p. c.
Therefore marsh gas=52.18	"

JAN. 26TH, SPECIMEN No. 5.

Carbonic acid	None.
Illuminating hydrocarbon	29.86
Marsh gas	51.33
Hydrogen	None.
Oxygen-nitrogen, (as air)	18.81
	100.00
Sp. gr, .877; sp. gr., deducting air, .848. Sp. gr. of residual gases, after absorbing illuminants and deducting air, .702. Sp. gr. of hydro-carbons	1.272
The sp. gr. of residual gases, after deducting air and hydro-carbons, (viz. .602) showed marsh gas	90.
Carbonic oxide, or nitrogen	10.
As in subsequent experiments carbonic oxide was in no case found, by explosion or absorption, and nitrogen was found in excess of proportion in air, the sp. gr. of the mixture may be assumed to be owing to nitrogen	10.
*Marsh gas	90.

JAN. 26TH, SPECIMEN No. 6.

Coal gas, air and naphtha gas from burner on west side of meter room, burner at time giving 18 candle flame, pressure 2.8 (burner 4 ft. check, 8 ft. tip brass, Gleason's,)	
Sp. gr. of mixed gases, .813	
Proportions of mixed gases, air	38.4
naphtha gas	38.8
coal gas	22.8
Per cent. hydro-carbons by estimation, (Specimen 5)	15.2
Per cent. hydro-carbons, found by trial	11.7
Loss by condensation or absorption in water	3.5

SPECIMEN No. 7.

Determined hydro-carbons	36.8 p. c.
Of this, absorbed with rapidity by sulphuric acid	8.0 p. c.
Residue absorbed slowly, $C_4 H_4$	28.8 p. c.
Hydro-carbon of higher condensation $C_3 H_3$	8.0 p. c.

The sp. gr. of the hydro-carbons corroborates this view. Sp. gr. of combined gases, 1.271; of $C_4 H_4$; .968; of $C_3 H_3$ 1.935.

An analysis of gas brought from Memphis gave—

Hydro-carbon $C_3 H_3$ plus $C_4 H_4$	25.419—formed car. acid—64.295
†Marsh gas	37.443—formed car. acid—37.443
Nitrogen	32.229—
Oxygen	4.908—

Exclusive of oxygen and nitrogen, drawn in through joints and leaks in retorts, the composition of the pure naphtha gas would be—

Hydro-carbon	40.437—Sp. gr.—1.271——Lighting Power [Thompson] Candles, 51.4
Marsh gas	59.564—

It may be considered then that the gas is of great illuminating power and non-condensable by ordinary degrees of cold; less condensable, in fact, than coal gas, which does contain some hydro-carbon vapors.

There is no doubt that the relative proportion of illuminating and marsh gas is controllable to a certain extent, not yet determined.

Communicated by Mr. H. H. EDGERTON of Fort Wayne, Ind., under date of March 11, 1871.

ANALYSIS OF PETROLEUM-NAPHTHA GAS.

Part of Specimen No. 5, 2d Series.

Gas employed, vol.	514.2.	Reduced vol. 193.152
After pyrogallate of potash	512.1	Reduced vol. 192.363
Oxygen per cent.		.408
After SO_3 HO		107.806
Illuminating hydro-carbons per cent.		55.814

RESIDUAL GAS.

Volume employed	13.494
After air added	210.506
" electrolytic detonating gas	230.790
" explosion	180.343
" potash	158.556
" pyrogallate of potash	156.264
Nitrogen added in air	155.710
Nitrogen in original gas	.554

	In 1 vol. gas.
Hence carbonic acid formed.....21.787	1.683
oxygen used.....38.999	3.013
contraction (C).....30.163	2 231

An analysis after agitation over two volumes of water gave—

Volumes employed	19.462
Carbonic acid formed	31.101
Oxygen consumed	55.973
Contraction on explosion (C)	42.750
Residual nitrogen (by pyrogalline)	1.584

The above gas (No. 5) was taken as an average from a yield of 80 cubic feet per gallon of commercial benzine.

[We append extracts from several supplementary communications of Mr. EDGERTON.]

In another letter (March 16) he says: I send you in continuation a few analyses of petroleum-naphtha gas.

No. 5—2D SERIES.

This gas was made from benzine at the rate of 80 cubic feet per gallon.

First—Gas employed	7.359	
Carbonic acid formed	15.468	
Oxygen consumed	25.525	
Nitrogen in gas employed	.350	(By electrolytic hydrogen.)
Second—Gas employed	7.214	
Carbonic acid	15.176	
Oxygen consumed	24.685	
Contraction	16.152	
Nitrogen left	140.149	(By hydrog.)
Added in air	139.754	
Nitrogen in original gas	.395	

		Per 1 vol. gas.
In the First—Carbonic acid formed	10.260	2.626
Oxygen used	16.204	4.147
Contraction	9.281	2.401
In the Second—Carb. acid formed	10.102	2.654
Oxygen used	15.604	4.099
Contraction	9.129	2.398

It would seem then that the illuminating hydro-carbons taken togother, give very nearly—

Per volume	2⅝ CO_2
Consuming	4. O.
and Contracting	2½ vol.

and the non-absorbable—

Per volume	1⅝ CO_2
Consuming	3 O.
and Contracting	2½ vol.

This relation would hardly seem accidental.

In regard to photometrical observations, I have made many with this gas, but am sorry to say I cannot get a burner to suit me: the best one I can find, a two foot Scotch tip, gave me under one-tenth inch

[* It would appear from this that the 51.33 p. c., rated as marsh gas, was one tenth nitrogen, corresponding to 5.13 p. c., and equivalent to 6.41 of air, which, with the 18.81 shown directly by analysis, in all 25.23 p. c. of air, must have been, as Mr. EDGERTON opines, mostly "drawn in through joints and leaks in the retorts" by the 3-inch vacuum. The extraordinary fact is developed by this analysis that the naphtha vapor is substantially broken up into a permanently gaseous mixture of

Marsh gas	60.74
Hydrocarbon gases condensable by sulphuric acid	39.26
	100.00

H. W.]

[† In a letter since received Mr. E. states that he has since identified a small proportion of another gas which he above puts with the marsh gas, as *methyle*, $C^2 H^3$.—H. W.]

pressure, 13 candles from one cubic foot of gas per hour. The gas then was not sufficiently burned.

It was determined, against our coal gas previously determined, at 13½ candles per five cubic feet.

March 22d, he says: My trials of candle power are *not* reduced according to the Rule of Squares, when comparing this gas. For instance, my 80 cubic feet per gallon gas, burns one foot per hour, equalling in light a five foot 13½ candle gas burner. You can calculate what an enormous power the Rule of Squares would here give.

I put the relation 1—5 to suit the orthodox people. Sixty feet gas per gallon gives 1—7.

[To be concluded in our next.]

CHEMICAL EXCERPTA.

1. *Carbolic Acid as an Adulterating Agent.*—A Russian chemist, FLUCKIGER, refers to the use of this coal-tar product for adulterating oil of cloves, and prescribes for its detection, thus: agitate with 50 or 100 volumes of hot water, decant the latter and evaporate it, add a little ammonia and good bleaching powder and agitate. If carbolic acid be present a blue color will in time appear.

3. *Artificial Production of another Complex Vegetable Principle.—Coniine*, the liquid alkaloid found in *Conium maculatum*, or poison hemlock, has been made artificially, by Dr. H. SCHIFF. We may look soon for quinine and morphine, which we have so long waited for, as laboratory products. Coniine has been made by the action of alcoholic ammonia on butyric aldehyde at the boiling point, by which is formed *dibutyraldine*, from which by simple distillation, the elements of water separate, leaving coniine.

4. Dr. C. BULLOCK (*Am. Jour. Pharmacy;* March) has determined the freezing point of mixtures of glycerine with water, interesting in connection with gas meters. Commercial glycerine of sp. gr. 1.25 was mixed in different proportions with one gallon of water in each case. With half a pint froze at 30 deg. F., with one pint at 24 deg., 1½ pint at 18 deg., 2 pints at 10 deg. and with 3 pints below 3 deg.

5. *American Ice Manufacture.*—The New Orleans ice-factory runs six machines, each costing $25,000 in gold, and freezes sixteen tuns of ice daily. The water is pumped from the Mississippi, purified, and frozen into blocks three inches thick, and twelve by twenty-four inches in area.—*Am. Artisan.*

6. *Analysis of Peat from Sweden.*—A "very hard and compact" variety gave Dr. O. JACOBSON specific gravity = 1.07—water 11.5 p. c. The dry peat gave ash 5.02; carbon 51.38; hydrogen 6.49; nitrogen 1.68; oxygen 35.43.—*Chem. News.*

7. *Freezing of Bisulphide of Carbon.*—In this REPERTORY for July 2, 1870, we cited statements of VON WARTHA on this subject, to the effect that the bisulphide, instead of standing a cold of 130 deg. below zero Fahr., freezes at about 10 deg. below. BALLO has stated since to the Berlin Chemical Society that VON WARTHA's error arose from the existence of a hydrate, containing one equivalent each of water and of the bisulphide, equal to 19.14 of water.

8. *Leaden Bullets melted by Impact.*—It will no doubt be remembered by some of our readers that when a stream of bullets was directed against an iron target from Perkins's steam gun, a homogenous mass of lead was produced by the partial melting and reunion of the mass. In No. 7 of *Poggendorff's Annalen* for 1870 we find detailed record of a similar phenomenon, as observed in some experiments at Basle, where bullets weighing 40 grammes were discharged against an iron target at 100 paces. The bullets, after impact, weighed only 13 grammes, the remainder being melted and scattered about in a form bearing witness to its fluid condition. Mr. ED. HAGENBACH calculates the amount of heat which should be developed by the impact of the 40 grms, at a velocity of 320 metres per second, and finds it to be .49 units, while the heat required to raise the temperature of the ball from 100 deg. C., its presumable initial degree, to the melting point of lead, 335 deg. C., and for fusing 27 grms., would be .44 units. Thus showing, as might be supposed in advance, from the suddenness of the action, that almost all the heat developed is applied to this heating and fusion, and but little expended in producing motion in the target, or lost by radiation.—*Jour. Franklin Institute.*

9. *Electric Light.*—In some experiments made at St. Petersburgh it was found that by aid of an electric light, a target at 1660 yards was so well illuminated that, with an ordinary field-piece, the balls could be invariably lodged as truly as in daylight. Objects at some distance, on either side of the target, were also rendered clearly visible.—*Ibid.*

10. *Coloring Matter for Butter.*—Annatto is used for this purpose. A French chemist, QUESNEVILLE, proposes, as more satisfactory, a color obtained from carrots, by slicing, drying and treating with bisulphide of carbon, distilling off the latter. Pure carotine, thus obtained, is tasteless and inodorous.—*Chem. News.*

11. *Making Cod-Liver Oil Palatable.*—A German pharmaceutist, HAGER, recommends *chloroform*, 10 drops to 3½ oz. of oil, for this purpose.

12. *Boiler Incrustation.*—Among the many means proposed for the prevention of this cause of danger, loss and inconvenience, too little attention has been given to those which might be described as preventives rather than cures. The preliminary purification of water by filtration, and by chemical treatment, such as the precipitation of carbonate of lime by lime water, known as Clark's method, and the use of surface condensers, either of the immersed or of the evaporative type, are worthy of attention in many cases where less effective, and, in the end, more costly means are now in use.—*Jour. of the Franklin Inst.*

Wood Gas.

In a valuable article read lately to the *London Chemical Society*, on the Distillation of Wood, to make wood spirit, Prof. E. T. Chapman, of Toronto, gives us the following on this subject.

I will now proceed to describe the general process of wood-distilling. The vapors which are generated by the action of heat on the wood in the ovens are generally taken off by a pipe from either the upper part of the end, or from the top, and conducted direct into the condensers. Here water, acetic acid, naphtha, and tar are more or less perfectly condensed, but a large volume of permanent gas passes through the condensers. In this country, it is generally allowed to escape; abroad, it is almost invariably burnt under the ovens as fuel. The composition of this gas varies greatly with the time that the wood has been in the oven, and with the heat employed; if a sample of it be collected soon after the decomposition of the wood has commenced, it will be found to be colorless, have scarcely a perceptible smell, and to burn with a blue flame. It consists of a mixture of carbonic acid, hydrogen, and a hydrocarbon, apparently marsh gas. As the temperature rises, the escaping gas becomes clouded with a tarry smoke: it now burns with a yellow smoky flame. If a sample of it be collected and allowed to stand for two or three days in a bottle, it deposits tar and becomes colorless; and if the temperature of the ovens has been kept very low, it burns with a yellow, slightly luminous flame. It contains carbonic acid and gases absorbable by bromine. After the carbonic acid and the gases absorbable by bromine have been removed, the gas burns with a blue flame like that of alcohol, and consists of a mixture of carbonic oxide, hydrogen and hydrocarbon gases—probably chefly marsh gas. Towards the end of the operation, the gases are richer in illuminating power, not derived from gases absorbed by bromine. Even right up to the end of the operation, however, the gas, when purified by long standing, tereatment with bromine, washing with alcohol, and then with aqueous potash, has very little illuminating power. It does not appear, therefore, that any hydrocarbons of the marsh gas series of at all complex formulæ are produced Carbonic oxide increases in quantity as the operation proceeds; and towards its close, especially if the temperature be allowed to rise rather high, its quantity is very considerable. I have had neither time nor opportunity to make a full and careful examination of the gas, but the foregoing sketch will give a general idea of its nature. I think I may say that it consists essentially of hydrogen, carbonic acid, marsh gas, and carbonic oxide, with varying quantities of olefines, probably ethylene. The carbonic oxide increases in quantity throughout the whole operation till its close. The illuminating power of the gas, after standing and washing in alcohol, is greatest somewhat before the close; but if the temperature be kept low in the ovens, the illuminating power in the washed gas is never high. Of course the gas is charged with volatile liquids produced during the distillation, therefore it has considerable illuminating power as it leaves the condensers.—*Chemical News.*

Accident to a Gas Holder at the Beckton Works, London, England.

[The extraordinary resemblance between the catastrophe here related, and that which occurred to the holder of the Brooklyn Co., during the past winter, scarce need pointing out. The most curious point in this more recent case is that it would not appear to admit of doubt that the gas at the Beckton Works was kindled—as was maintained by some in the Brooklyn case—from a spark struck from the iron during the violent concussion.]

We have to regret a very serious accident which occurred to one of the gasholders at the Beckton Works, on Monday, Feb. 27th. The holder in question was the one nearest the river, and, with three, had been at work for some months, experiencing during that time the action of some heavy gales of wind, and withstanding them in a very satisfactory manner. On the morning of the 27th it was again blowing a stiff gale, and the gasholder, which was at its height, was suddenly seen to give a lurch, resting for a moment or two, it is said, on the edge of the tank, and a great escape of gas took place. The officers in charge of the works immediately extinguished all fires and lights in the vicinity, so as to prevent the gas catching light; the gas holder gradually righted itself in the tank, and all danger seemed at an end. But in the course of an hour or so, when the holder was about half way down, the top of one of the iron columns fell on the crown, smashed it in, and at the same time struck a light, which fired the gas. A great but harmless blaze ensued, which continued till all the gas was burned—about two minutes. The cause of the accident is now under investigation. It seems probable that, when the gasholder lurched, the guide-wheels may have given a violent twist to the columns, and so have caused a fracture at a weak spot or defect in the casting. This seems the more likely as nearly all the columns are fractured. The one which fell, too, may have been insufficiently fastened to the girders. Nothing would have appeared more unlikely than the occurrence of such an accident at Beckton, where, from the knowledge that the holders would be exposed to heavy winds, an unusual number of columns were placed around to withstand the action of them. As we have said, an inquiry is in progress, in order, if possible, to ascertain the cause of the accident; and we trust, for the sake of gas engineering generally, a satisfactory explanation may be arrived at. In the meantime, we think the moral to be drawn from this and similar occurrences is, not to fill gasholders or tanks in exposed situations too full in windy weather. We have omitted to say that there was no explosion whatever; and it must be a great satisfaction to our contemporary, the *Echo*, to learn that Woolwich Arsenal was unharmed by the accident.—*London Journal of Gas-Lighting.*

[Communicated.]

Death of James Hoy, Esq.

In noticing the death of JAMES HOY, ESQ., which took place in New York city on the 17th of March last, we feel that the pursuit whose interests we advocate, has lost one of the most eminent of its members.

Mr. HOY was among the pioneers in the business of erecting gas works, and organizing gas companies throughout the United States. Nearly thirty years ago, in the city of Trenton, he laid the foundation of that business, and brought to it all the sagacity and energy which were so eminently his characteristics. He made it a success, and reaped from it fame and fortune. Several years ago he removed to this city, and rapidly took high rank in our business world, for his probity, industry and unerring sagacity. He ultimately became one of the proprietors, in connection with his energetic and scientific coadjutor of many years, JOHN P. KENNEDY, Esq., of the Atlantic Dock Works in Brooklyn, and was connected with this enterprise at the time of his death.

The perfection to which the gas works in many of our cities has reached, is owing in a great measure to Mr. HOY's rare judgment and skill. In the erection of all the works undertaken by himself and partner, no expense was spared in procuring all the aids that science offered. In their construction, permanency and perfection were kept steadily in view. The result has been, that wherever you find their work, it is always the best finished and most complete of any of a like character in this country. At the time of his death he was engaged in erecting the Works of the Mutual Gas-Light Company of New York, destined when completed, in their capacity and thoroughness of construction, to be the finest gas works in the world.

Mr. HOY, therefore, has not lived in vain. He has left behind him memorials that will transmit his name and fame to their generations. In all the relations of life he nobly fulfilled his responsibilities. He will be missed in the social circle as well as in the business world. There his genial manners captivated those with whom he associated, and won him hosts of friends, who now sincerely mourn his loss. In the sacred precinct of his home that he gladdened with his presence, there is a void that can never again be filled. The memory of such a man is indeed precious.

Correspondence.

[Correspondents, in all cases, should sign their communications with their names and address in full—not necessarily for publication, but as a guarantee of good faith.—Eds.

[Written Expressly for this Journal.]

Peat—Methods of Preparation, Practical Observation, Etc.

BOSTON, May 1871.

Messrs. Editors: Resuming the subject just where I left it abruptly, in my last, I remark that the various methods proposed for the preparation of peat for fuel, and the experiments tried, whether in themselves successful or not, have all tended to afford light upon the subject, some indicating difficulties to be overcome, others suggestive of improvements.

All have acknowledged that there were certain difficulties in the way of perfect success, many of which were apparently so insignificant that they could at any time be overcome, and therefore have invariably been passed by; each being ambitious to cope with the greater difficulties, apparently unmindful of the well established fact that the perfection, economy and profit of most kinds of manufacturing business, lays in the proper attention to details and little things.

It is evident that in order to secure the permanent success and general adoption of any process and machinery for the manufacture of this fuel, it is essential that it combine the *maximum* of capacity for production, perfection of treatment, and economy of operation.

Machinery is now constructed which overcomes the difficulties, embodies the improvements, and meets the requirements referred to.

The principles involved in its construction and operation are the result of several years practical experience, and are plainly demonstrated and distinctly acknowledged to be correct, and effectual for the purpose required.

A mill of the character referred to, may be briefly described as follows: A suitable frame-work of iron supports a tank or chest about three feet square and four feet deep, the open top of which is level with the second floor of the building in which it is placed. Within this tank, which is called the pulping mill, is operated a simple apparatus, which receives the crude peat just as it is taken from the bog, relieves it at once of a portion of the water contained in it, cuts up any sticks, roots, or fibrous material which may be mingled with it, crushes the entire mass, ejects from it the air, of which a large amount is contained in its cells, and taking advantage of some of the natural properties of the material, develops by simple but uniform treatment, its plastic and adhesive properties, while at the same time, the particles are drawn out, laminated, and packed in such manner as to form a dense mass, having the appearance of a wet felt, and possessing strength and cohesion.

In this condition it is brought to a high temperature, by adjustment of steam-chest and pipes, and then rapidly molded into form by an equally simple and perfectly operating apparatus, adjusted under the pulping mill and supported by the same frame; the blocks hot and steaming being delivered in successive series of six each, on boards convenient to handle, are removed to the spreading ground or dry house, where evaporation, already rapidly progressing, soon relieves them of the remaining moisture; the particles contracting with and about each other, acquire strength and solidity, and the fuel is soon ready for use, or may be housed and left to cure still further, improving, as it unquestionably does, by age.

The process is at once simple, rapid, and effectual. The peat is delivered in blocks convenient to handle, and may be housed after exposure in the open air from two to ten days (according to the weather), or may be dried in a dry-house properly constructed, in a single day or less.

By the treatment described, the original organization of the peat is destroyed, and instead of a soft, porous, sponge-like mass, we have, as a product, a material more of the consistency and appearance of coal, which breaks with a fracture similar to stone, and which can never again be dissolved in water, but retains permanently its mineral like qualities.

The mills referred to are much more perfectly constructed than any ever before offered, or than most people are prepared to look for. They are neither delicate nor complicated, but are compact, strongly built, perfectly adjusted, and are, withal, attractive in style and operation. They weigh about three tons, cost about $2,500, require about ten horse power to operate them, and will treat and mold in good shape, from 80 to 120 tons of crude peat per day, yielding a product equal to from 20 to 35 tons of dry fuel, which measures about 35 to 38 bushels per ton of 2,000 lbs.

Running at moderate speed one mill turns out 40,000 blocks per day, which from ordinary peat should weigh 16 to 20 ounces each, when dry. It may, however, be gauged to run any where from 1,000 to 60,000 of these blocks per day.

This is the size of mill which is considered most desirable for manufacturing the fuel in large quantities for a market; and where works on an extensive scale are required, several mills can be placed side by side, and operated by the same line of shafting.

Mills of smaller size are also to be had, some of them as low as $500 and even $200. They are portable, can be run by horse power (or steam), and are desirable for farmers' use, or where several can club together to make fuel for their own families or for sale.

The most desirable location for a building in which to manufacture the fuel is on a side hill, so that while the machinery is placed on the lower floor, the crude peat may easily be hauled to the level of the second floor, and there dumped by the cart load or car load into the top of the mill.

The laborers required to tend a mill of the size described above, i. e., to feed the material into it and take from it the blocks as formed, are four men and a boy. Additional labor is of course required to cut or excavate the peat from the bog and haul it to the mill, also to remove the blocks when manufactured, and spread, gather and house them. The cost of this, as is readily seen, must depend much upon the location and surroundings, but can easily be estimated by each individual in his own case.

The most liberal estimates, rating wages even as high as two dollars per day for men, and one dollar for boys; corroborated by repeated statements from those who have manufactured the fuel, fail to make the entire cost for all the labor of cutting, hauling, manufacturing, drying, housing and storing, amount to more than $1,50 per ton; while the statement now repeatedly made that the cost for labor need not exceed *two dollars per ton*, is believed to cover more than a fair allowance above the actual necessary cost, for any contingencies, accidents or delays, likely to occur in a properly managed establishment.

The cost of one of these mills, with engine, boiler, shafting, and the building in which to place and operate it, should be about $5,000.

Where the business is to be conducted on a large scale, any number of machines may be operated side by side, and the cost *pro rata* will be much reduced, as the expense for building, engine and boiler will be but slightly increased one man can easily superintend several machines, the laborers generally can be employed to better advantage, and numerous mechanical appliances to save manual labor and expedite operations, which it would not be advisable to construct where a single machine only was to be run, may be economically introduced on more extensive works. The profit of such an establishment will therefore be largely in excess of smaller works.

In some cases it is quite practicable to bring the crude peat from the bog to the mill by simple machinery, without the use of horses; and in like manner the manufactured product may be removed from the mill to the spreading ground or dry house, by mechanical means, and even without touching it at all. These matters are no parts of the manufacturing process, but are simple appliances, easily arranged and open to the free use of all.

A fair quality of peat as taken from a well drained bog, weighs, ordinarily, from 50 to 55 lbs. to the cubic foot. In the process of manufacture its *bulk* is reduced by the forcible ejection of the air and a portion of the water contained in its cells, from 30 to 50 per cent., and by the subsequent evaporation of the remaining moisture it is still further reduced, while its *weight* is diminished solely by the loss of water.

A ton of wet peat as excavated from the bog will measure about 40 cubic feet, and about 160 cubic feet are ordinarily required to produce one ton of dry fuel. Few peats, however well drained, contain less than 50 per cent. of water, and most contain 65 to 85 per cent. It is generally considered quite fair to estimate on 75 per cent. of moisture. An acre of peat, of fair quality, well drained, if one foot in depth, will generally contain 1,000 to 1,200 tons, yielding 250 to 350 tons of dry fuel, and greater depths in proportion.

Peats vary much in their heating properties, as do woods and coals, according to their growth and composition. The most thoroughly decomposed and compact deposits yield, when manufactured, the most dense fuel, at no greater cost for labor than the lighter and more porous material, and are therefore the cheapest. The fuel should be housed where free circulation of air may be had, but protected from rain and snow.

Of the peculiar properties and value of this fuel, its special adaptation for various purposes and the character and extent of deposits of the crude material, I have remarked in previous letters. The want of the fuel is widely and earnestly expressed. The economy of it for those who would produce it in small quantities only, for family use, is apparent, while for those who would produce it in large quantities for sale, the margin for profit is large, even at rates which shall clearly characterize it as a *cheap* fuel; and a good fuel at low price always *commands* purchasers.

The process of manufacture is reduced to a well demonstrated system, and the business can be entered upon as prudently and understandingly, and on as fair an estimate of expenditure and return as any other; and with the proper means and appliances, which are easily procured, and the same ordinary, prudent and intelligent management which any other business demands, this surely invites attention and gives promise of reward, far in excess of most kinds of manufacturing.

Will write again in season for your next issue.

Very Respectfully,

T. H. LEAVITT.

The Dip-Pipe Controversy.

NEW YORK, April 20, 1871.

Messrs. Editors: Your alphabetical correspondents, "W" "X" "Y," appear desirous that the gas engineers should accept their theory as a foregone conclusion, without giving any data of the wonderful results obtainable by using Gibson's valves. The similarity of their communications seem to imply a very feeling regard for the pet they have adopted. Not finding any new matter of interest in "W's" reply to mine of the 2d inst., I therefore propose in this communication, rather to deal with the question involved, than to weary your readers with repetitions of the same subjects.

Permit me to say this Gibson plan is neither new nor original. (See Clegg on the same subject.) To my mind, it has not a feature that will recommend it to any practical engineer. If its advocates would be a trifle more modest in their assertions, they might perhaps exhibit some unwary ones; but they fall into the common error by *proving too much*. How is it with all the advantages and pushing, they cannot point to a single works of any note that has adopted it, after being before the public three years? "W" endeavors to show an alarming amount of good to be derived in consequence of the pressure being intermittent. Why is it so? Because the present arrangement is in itself of such a simple and natural character, that it just resembles the respiratory organs of the human system; its music is a sure indicator to the stoker, it [tells the working condition of the retorts to the superintendent; if a retort is broken, he can by his accustomed ear detect it by this same intermittent pressure, which is to the stoker his only safeguard. Looking at it from an engineering point of view, what do I expect, and from the co-existant state of things, is sure to follow, if this Gibson plan was to be adopted. Take the Manhattan Works, for instance, who, although I believe their works is second to none in this country or in Europe, for completness of character and beauty of arrangement, still if there was the merit claimed for this process, their engineer, I have no doubt, would long ago have had the benefit of it.

To those who have not had so much experience in gas manufacture, allow me to say you cannot make gas by magic, nor increase your illuminating power by legerdemain. Gas making although all smoke, is an *art* of all others, where cause and effect are sure to follow. Mr. "Y" in his communication, has inadvertently undertaken to prove my case, for he says "at times the tar in the hydraulic main becomes thickened, and often forms masses which clog the dip-pipes." This is true as far as the stand pipes go, but not as to the hydraulic main, the liquid contents being tar and ammoniacal liquor, which is charged twenty times a day. Now it being a well known fact, that in working retorts very hot, there is a great liability at times to choke up the stand pipes with hard, tarry matter. This circumstance alone, would be fatal to introducing any slide valve in such a situation. The working parts of the valve would of necessity be covered with the hard, tarry matter, and it would be found impossible to close it when charging the retort. The same thing would occur in opening the valve after the retorts had stood idle a short time. Next to the expense of fitting up a works with these valves, there would be an extra man required to every gang of men in a large works, to open and close them. During charging there is the risk of having charged the retort, and not being able to open the valve; the wear and tear in such a situation must necessarily soon cause them to leak. In such a contingency, how is it proposed to repair them? It seems to me, to repair one valve, it would be necessary to stop the whole works. I am free to admit, that were

it possible to get rid of the accumulation of hard carbon in clay retorts, it would be a great gain. But it is not possible by any such contrivance; even then it is absurd to suppose the yield and illuminating power would be increased 20 p. c. It is a fallacy to suppose this substance that forms in clay retorts, is so much power and quantity taken away from the gas, when in reality, it is created by the high heat used in working clay retorts, from the heavy hydrocarbons, or tarry vapor, which at a lower heat would pass off as liquid tar and ammoniacal liquor. This is clearly demonstrated by the non formation in the iron retort. In conclusion I would observe, my opinion is based upon practical experience of over twenty years with both iron and clay retorts, and, although I cannot endorse this alteration, I think something might be substituted for the hydraulic main, stand pipes, etc., in their present situation (which frequently causes serious mischief to the retorts, by reason of the expansion and contraction of the retort beds, often throwing the whole weight upon the mouth-pieces of the retort, and very often breaking it as also the connecting joints). I think this can be accomplished; if so, it will be an important point gained, both as a matter of economy and effectiveness.

Resspectfully Yours,
JOHN KEELING,
Gas Engineer.

A Testimonial in favor of the Gibson Improvement.

OFFICE OF THE NEWTON AND WATERTOWN GAS-LIGHT CO., NEWTON, April 14th, 1871.

Messrs. Editors: In reply to a "Constant Reader," permit me to say that I have had experience in the use of the Gibson Improvement daily, since August 1869, and that since its adoption I have had no trouble from carbon accumulating in my retorts, and have effected a great saving in coal. The valves keep themselves lubricated, and give no trouble from leakage or otherwise. I consider them perfectly safe, and can see no reason why they will not run for years, without any cost or repairs. I have the spindles wiped and oiled about twice a week, which is all that is necessary to keep them in order.

A "Constant Reader" is slow to believe that so trifling a pressure as half an inch at the dip-pipe, can cause the accumulation of carbon in the retort; but it is not the fact that a half inch dip produced *only a half* inch pressure upon the retorts, as he may readily satisfy himself of, if he will place a pressure gauge on the bridge-pipe, and if he will make a trial of dispensing with the dip-pipe altogether, as I have done, he may satisfy himself that the cause of the hard carbon in retorts is mainly due to it, whatever may be the explanation, and that it makes little difference whether the dip is Half an inch or an inch and a half.

Yours truly,
L. P. GEROULD, Sup't.

Words of Encouragement from Afar.

MILAN, March 21, 1871.

Messrs. Editors: We have pleasure in sending you a copy of our *L'Industriale*, which is the only mechanical journal of the kind published in Italy, and as we give in it every important information of a practical nature in Italy and other European nations, when we can find the information, we should be most happy and would esteem it an honor, to have the exchange of your most valuable and world-famed Journal; and although we can only offer you our poor attempt in return, we hope you will take the "will for the deed," and give us encouragement to mend, as time and events roll on.

With kindest respects and compliments, we have the honor to remain Yours truly,

CANTONI, MACKENZIE & Co.,
Per R. F. MACKENZIE.

On Gas Meters.

KNOXVILLE, TENN., April 20, 1871.

Messrs. Editors: In your last issue of the Journal, I notice certain statemeuts to the effect, that superintendents of gas works, as a class, are not desirous that the consumer should understand the working of the gas meter. I think such statements are unjust to us, and at variance with the facts, and I desire for my own part, and for the parts of all the gas men I am acquainted with, to contradict the statements. I believe those who have the management of gas works are not only desirous, but are anxious to impart to the consumer all the information they may require, relative to the working of the meter. If there are any gas men who work in "such ways that are dark," as you seem to think, then they work against their own interest, for the best customers I have are those who understand the working of the meter. I am of opinion that the majority of gas engineers desire that all the consumers should thoroughly understand the meter, because it is to the interest of both parties that they should do so.

Respectfully,
JAMES SOMERVILLE, Sup't.

[Our correspondent is evidently laboring under a wrong impression. If he will again read the article referred to, *in a careful manner*, he will find no such allusion made, as he asserts.]

Clay Retorts Without Exhausters.

GALENA GAS CO., ILL., April 21, 1871.

Messrs. Editors: As I have seen a good deal said in your Journal about small gas works using clay retorts, without an exhauster, I would say for their information, that we have used for the last three years none but clay, without an exhauster, with entire satisfaction, and that we should not think of using any other, as we find them more profitable than iron by fifty per cent. Our retorts are made by Hambleton & Green, St. Louis.

Yours truly,
F. J. UHLRICH, Sup't.

A New Invention for Lifting Water.

A number of gentlemen visited Bridesburg recently, to witness the operation of a new invention, known as the Patent Compound Propeller Pump, erected near the works of the Bridesburg Manufacturing Company. The pump, or more properly speaking the water elevator, possesses a number of new features. The one exhibited consists of a cast iron pipe, twenty inches in diameter, cast in longitudinal sections of about six feet each and bolted together.

In the intervals between these sections are shorter sections, one foot long, with beamings supporting a shaft, made of steel, extending the entire length of the pipe. On this shaft are placed, at intervals of from three to six feet, screw propellers, with two blades with an angular pitch of sixty-five degrees, and revolving with the shaft. Midway between these propellers, and attached to the walls of the pipe are wings or blades of the same pitch as the blades of the propellers, but of a reverse angle. The lower end of the elevator is protected with a guard to prevent stones, etc., from passing into the pipe. At the top of the elevator, above the spout or nozzle, which directs the stream as the water passes out, is a disc secured permanently, upon which rests a ring of brass; on top of this is another disc, embracing the outer periphery of the brass ring. This upper disc is secured permanently to the propeller shaft.

By means of a small donkey pump, water is forced between the two discs under sufficient pressure to slightly separate them, so that the top disc, propeller shaft and column of water are supported by the film of water between them, and thus the rotation of the propeller shaft, revolving on the water causes but slight friction.

On revolving the shaft, a constant and solid stream of water flows from the elevator, of the size shown, at the rate, it is said, of 10,000 gallons per minute; the propeller lifting the water on the stationary wings or blades above it, by which it is supported, and from which it is taken by the next succeeding propeller, and so on until the water is discharged, thus avoiding all valves or other machinery. One of these elevators, 300 feet long, is now at work in the Glen Carbon Colliery. It is eight inches in diameter, and discharges from the top 1,700 gallons of water per minute. The advantage claimed for this elevator is economy in cost and running expenses.—*RR. and Min. Reg.*

Some Needed Inventions.

American invention has done its full share in reducing the sum of human misery. The world is debtor to it for much that has simplified labor by supplanting or supplementing muscle with mechanism and machinery. The cotton gin, the steamboat, the sewing machine, the mower and reaper, and many other ingenious combinations or appliances have gone out from us to gladden the world and receive the grateful recognition of mankind. But enough is left to be done to occupy the most inventive genius, and in directions which promise ample remuneration to the fortunate discoverer. Of these needed inventions we may mention a few, not necessarily as wonderful or as widely influential as those above referred to, but which are none the less desirable. Moreover, there is a fortune in store for the happy man or woman who shall first introduce any one of them to a waiting world.

Let us, first and foremost, in behalf of the housekeepers of every civilized country, bespeak the invention of some safe contrivance for the washing of dishes, which shall do this branch of domestic work with the least possible drudgery. Very few husbands know how large a share of female human life is now worn out both by mistresses and maids in this least showy, but most constant of all household occupations. One of the greatest of woman's wrongs, to-day, is the compulsory sacrifice of her time and temper to the inexorable claims of each meal's crockery. Even if her own hands are not obliged to undergo parboiling in the process, her cleanly tastes must be outraged, and her nerves shattered, and her purse depleted, by the slovenly or careless mode of procedure whereby Biddy bedaubs or breaks the fragile cups and plates. That this work, or most of it, can be done by some nicely adapted mechanical appliance, certainly seems to be among the possibilities. The only wonder is that it takes so long to hit upon it.

Another great want of the household is the invention which shall render inodorous the kerosene which has come to be the mainstay of most people outside of the cities as an illuminating agent. In whatever shape it is used, the "scent of the kerosene hangs round it still," and round everything else as well. It does little credit to chemical science and progress that so many thousands of homes should be obliged to implore, in vain, relief from this ever present nuisance. The man who will supply this desideratum is sure of being hailed (and paid) as an almost universal benefactor.

Another want is a smoke-preventing apparatus, which will permit the consumption of bituminous coal in furnaces and stoves. The essentials of a perfect combustion are well enough known, and the necessities of this special case can be theorized on *ad libitum* by persons who profess to be able to do what is wanted. But in practice all their promises fail, or if the thing is secured, it is at an expense of money and complexity which makes it useless. Else why do our steamboats, locomotives and stationary furnaces continue their pernicious and disgusting habits of smoking? If the invention has been introduced into English use, as some insist, how happens it that the Cunard steamers never have adopted anything of the kind by way of showing us how the thing is done? This question is one of great concern to all of our country lying west of the Alleghanies, and in the districts where bituminous coal so largely predominates. A practical solution of the difficulty would be a blessing to Pittsburgh, where a white face is an ephemeral vision, and a clean shirt is never seen. Seeing that this fuel is vastly more plentiful in the United States than anthracite coal, and in some sections is the sole dependence of the people, there surely are sufficient incentives for the development of some simple process of eliminating its only disagreeable characteristic. Here, then, are some fine openings for ambitious inventors. And when this order is filled, we shall be ready with another list.

PROCESS FOR THE DESULPHURIZATION OF COKE.—The process for desulphurization of coke, to be used in the reduction of iron, was patented by M. M. Grandidier & Rue. It consists in heating the coke to 250,300 C., stream of air which is compressed to 2½ atmospheres, at this temperature the coke itself does not burn, while the sulphuret of iron is completely oxidized. Part of the sulphur goes off as sulphurous acid, part is converted into sulphuric acid, which combines, according to Grandidier & Rue, first with oxide of iron and then with the argillaceous matter present. The coke, after this heating, is put into water, which dissolves out the sulphate of iron and part of the other sulphur salts. It is found that the sulphuric acid combined with clay is not given up to iron in the reduction furnace; hence its presence is not deleterious. Grandidier & Rue claim that the action is not only chemical, but also mechanical, the molecules being compressed. By this process they say that the reducing power of the coke is increased. The authors then go on to estimate the cost of the apparatus under different conditions, and also to give the quantity of coke used as compared with the quantity of ordinary coke.—*Le Genie Industriel.*

TO INVENTORS AND PATENTEES.

This Journal, circulating, as it does, throughout the United States, Canadas, and portions of Europe, is a superior medium for advertising.

Upon receipt of $3 we will send the Journal one year, and give a special description of any new invention of the subscribers, in the Inventors' Department.

We also take out Patents in the United States and Europe, obtain Extensions, and make a *Specialty* of difficult and abandoned cases.

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Inventors' Department.

Patents are granted for seventeen years, the following being a schedule of fees:

On filing each Caveat	$10
On filing each application for a Patent except for a design	15
On issuing each original Patent	20
On appeal to Commissioner of Patents	20
On application for Reissue	30
On application for Extension of Patent	50
On granting the Extension	50
On filing a Disclaimer	10
On filing application for Design (3½ years)	10
On filing application for Design (7 years)	15
On filing application for Design (14 years)	30

RECENT AMERICAN PATENTS.

Pertaining to the Specialties of this Journal, for the two weeks ending April 22d., 1871.

113,247.—Valve for Steam Pumps.—John V. V. Booraem, Jersey City, N. J. Antedated March 23d, 1871.

113,298.—Tubular Steam Boiler.—Jas. Howard and E. T. Rousfield, Bedford, England.

113,314.—Machine for Tapping Gas and Water Fittings.—C. B. Long, Worcester, Mass.

113,317.—Apparatus for Carbureting Air and Gas.—F. H. Lutkewitte, St. Louis, Mo.

113,366.—Water Meter.—I. P. Tice, New York city.

113,370.—Electric Gas Lighting and Extinguishing Apparatus.—John Vansant, San Francisco, Cal.

113,400.—Water Wheel.—Gardner Cox, Pierpont, N. Y.

113,440.—Apparatus for Drawing Water from Wells.—Merrick A. Mihills, Lodi, Ohio.

213,463.—Friction Condenser for Illuminating Gas.—Wm. H. St. John, Brooklyn, N. Y., and Samuel O. Rockwell, Jersey City, N. J.

113,466.—Tubular Steam Boiler.—Chas. A. Thomposon, Flushing, N. Y.

113,469.—Turbine Water Wheel.—McK. A. Brooks, La Porte, Ind.

113,567.—Gas Heater.—Orlando McKnight Reynolds and David Tuttle Kitchell, Oil City, Pa.

113,586.—Current Water Wheel.—H. B. Sinclair, Paw Paw, Mich.

123,191.—Liquid and Gas Meter.—D. B. Spooner, Syracuse, N. Y.

113,597.—Water Meter.—Wm. Van Anden, Poughkeepsie, N. Y.

113,702.—Manufacture of Pneumatic Gas for Illumination.—J. W. Stow, San Francisco, Cal.

PRICES OF FOREIGN AND DOMESTIC GAS COALS.

[Reported Expressly for this Journal.]
April 17, 1871.
DELIVERED IN NEW YORK.

English Cannel.			
Ince Hall	$11 25	@	11 75
Kirkless Hall	10 75	@	11 25
English Caking Coals.			
Newcastle Gas	$7 50	@	7 75
Liverpool caking	7 25	@	7 50
British Province Coals.			
International			6 00
Little Glace Bay			6 00
Pennsylvania Coals.			
Penn Gas Coal	$7 00	@	7 15
Westmoreland	7 00	@	7 15
Shafton	7 00	@	7 15
Youghiogheny	7 35	@	7 50
West Virginia Coals.			
MurphyRun	$6 75	@	7 00
Despard	6 75	@	7 00
West Fairmont			7 25
Fairmont	6 75	@	7 00
American Gas Coal	6 75	@	7 00
Newburgh Orrel	6 75	@	7 00
Pinnickinick	6 75	@	7 00
Cloverhill of Virginia	5 25	@	6 00
McKenzie Compound Mixture			8 50
American Cannel Coals.			
Peytona of West Virginia			$13 00
Darlington of Pennsylvania			— —
Asphalts.			
Albertite of New Brunswick	$16 00	@	17 00
Ritchie Mineral of West Virginia	— —	@	15 00
Trinidad Bitumen	— —	@	14 00

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Cements for Gas Works, Etc.

BEST ENGLISH AND SCOTCH FIRE BRICKS AND FIRE CLAY to stand the greatest test of heat.

Portland and Roman Cement to cement Gas Pipes and Cisterns.

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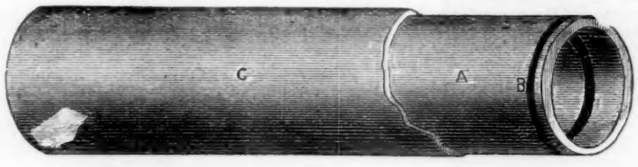
NORTHWESTERN

GAS AND WATER PIPE COMPANY.

WORKS AT BAY CITY, MICHIGAN.

CHICAGO OFFICE, 41 REYNOLDS BLOCK.

SECTION OF GAS PIPE.



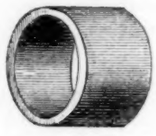


FIG. 2.

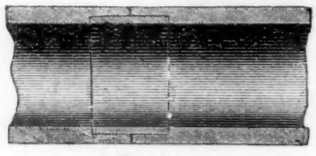


FIG. 3.

A—Cylinder of Wood. B—Band of Iron. C—Coating of Hydraulic or Asphaltum Cement.

FIG. 2.—Thimble for Connection. FIG. 3.—Horizontal Section and Connection.

Above is a cut of the

"WYCKOFF PATENT IMPERISHABLE GAS PIPE,"

manufactured by the NORTHWESTERN GAS AND WATER PIPE COMPANY.

This Pipe is made of White Pine, one inch to twelve inches bore, in sections eight feet long, rounded in a lathe, coated inside and out with Asphaltum, connected with a tenor, or socket, and a thimble joint, perfectly air and water tight, being driven together with cement furnished by the Company. When laid its cost is about one half that of Iron Pipe, and is UNQUESTIONABLY the best Gas conducting Main in use.

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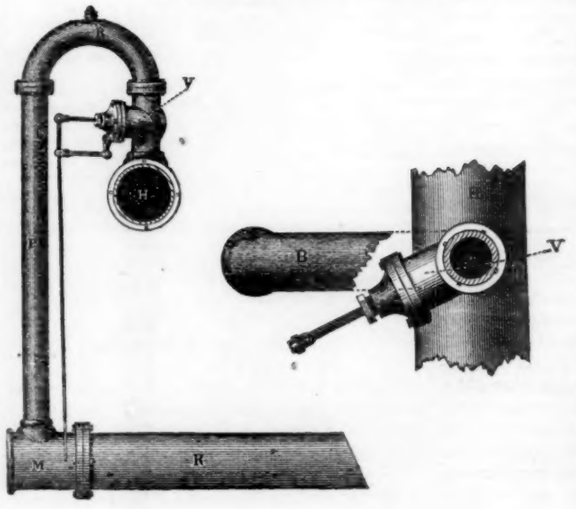

In the manufacture of Coal Gas by means of which Dip-Pipes are dispensed with, the deposit of Carbon in the Retorts prevented, and a very large saving is effected.

Licenses for its use will be granted; also the parts necessary will be supplied to order, on application at their office,

No. 79 Water street, Boston, or
No. 42 Pine street, Room 18, New York.

R Retort.

M Mouth-piece.

P Stand-pipe.

B Bridge-pipe.

H Hydraulic main.

V Valve-substitute for Dip-pipe.

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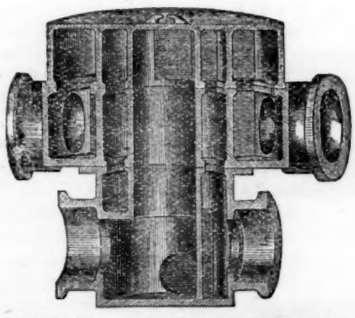

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Henry G. Morris,

SUCCESSOR TO

Established 1836.

MERRICK & SONS.

Gas Holders, Bench Castings, Condensers, Washers, Scrubbers, Purifiers, Dry Centre Valves, Exhausters, Purifier Trays of Wood or Iron, Iron Roof Frames, and Gas Machinery of all kinds of the most approved character.

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ARCHITECT AND GENERAL GAS ENGINEER,

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WILLIAM FARMER may be consulted upon all matters connected with the construction of GAS WORKS and other buildings. Will furnish General and Detail Drawings, Specifications and Estimates for Gas Works of any capacity, Retort Settings, Condensers, Washers, Exhausters, Purifiers, Holders, Coal Hoisting Apparatus, Iron Roofs, and every description of Machinery required in the Manufacturing of Gas.

PATENTEE OF THE FOLLOWING INVENTIONS:

Exhausters for Gas and Foul Lime Ventilation,
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Pumps for Water, &c., &c.

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CHARLES V. SMITH, Engineer Manhattan Gas-Light Company, N. Y.
CHARLES MOWTON, Engineer New York Gas-Light Company, N. Y.
SAMUEL P. PARHAM, Engineer Mutual Gas-Light Company, N. Y.
Prof. HENRY WURTZ, Editor Chemical Department GAS-LIGHT JOURNAL.
HENRY J. DAVISON, Engineer, 77 Liberty Street, N. Y.
HERRING & FLOYD, Oregon Iron Foundry, 738 Greenwich Street, N. Y.
FREDERICK SABBATON, Engineer Troy Gas-Light Company, Troy, N. Y.
Col. WHITE, Engineer People's Gas-Light Company, Williamsburgh, N. Y.
GEORGE W. PARSONS, Sup't and Eng'r, Rochester Gas-Light Co., Rochester, N. Y.
GEORGE W. EDGE, Engineer, Jersey City Gas-Light Co., Jersey City, N. J.
J. H. GAUTIER & Co., Fire Brick Works, Jersey City, N. J.
Professor SILLIMAN, New Haven, Conn.
JOHN HARRISON, Engineer People's Gas-Light Company, Baltimore, Md.
CHARLES FABEN, Superintendent and Engineer Toledo Gas-Light Co., Toledo, O.
PETER F. BURTIS, Supt. and Engineer, Chicago Gas-Light Co., Chicago, Ill.
JAMES R. SMEDBERG, Consulting Engineer, San Francisco Gas-Light Co., Cal.

A NEW EXPLOSIVE.—Messrs. Gebruder, Kreba & Co., of Cologne, explain some successful experiments with a new explosive called litho-fracteur. Of these, fifteen were made under every disadvantage—in mud, in water, and in every possible way conforming to the exigencies of war, to the entire satisfaction of the Commission. Lieutenant-General von Kameke, who has since earned such laurels in the late war, immediately saw of what immense importance litho-fracteur would be in warfare, as a trench 10 feet to 15 feet broad and five feet deep, and of any length, and on any ground, however frozen or stony, could be thrown up in a minute, and so a sheltered position for artillery, cavalry, or infantry, be immediately obtained by a loose layer of strong litho-fracteur. In fact, if every soldier carried a cartridge filled with this explosive, a whole army, in a moment of need, could intrench itself in positively no time. The discoverer of the combination of mixtures of which litho-fracteur consists has constructed a torpedo, which, drifting nine miles in any direction, at a depth of 10 feet, has shown a power of destruction beyond description, so much so as to prove that no vessel, however heavily armored, could exist one moment against its action. At least, so he says.—*British Trade Journal.*

TESTING GAS IN LONDON.—The argand burner of Sugg is the official standard for the measurement of gas in London. The burner for testing the ordinary gas of the Gas-Light and Coke Company, which ought to have 16 candle power, must be the London argand No. 1, of Sugg, with a glass cylinder two inches in diameter and six inches high. For the gas of the Imperial Gas Company and the South Metropolitan Gas Company, which must possess an illuminating power of 14 candles, the glass chimney may have $1\frac{3}{4}$ inches diameter and six inches hight. The chimney may be made seven inches tall if the flame leaps over the top. The London gas is regularly inspected, and the companies are required to keep up a fixed standard.

THE

AMERICAN GAS-LIGHT JOURNAL

AND

CHEMICAL REPERTORY.

PUBLISHED ON THE 2D AND 16TH OF EACH MONTH,

At No. 42 Pine Street, New York.

A. M. CALLENDER & CO.,

EDITORS AND PROPRIETORS.

This is a recognized official organ of—
LIGHT, HEAT, MINING INTERESTS,
MECHANICS, WATER-SUPPLY, PATENTS,
VENTILATION, SANITARY IMPOVEMENT, &
SCIENTIFIC SUBJECTS GENERALLY.

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☞ All communications to be addressed to "THE EDITORS, No. 42 Pine Street, Room 18, New York.

CONSULTING CHEMIST, GEOLOGIST AND GENERAL SCIENTIST—
PROFESSOR HENRY WURTZ.

[NOTE BY PROFESSOR WURTZ.—Contributions and items for which I am, as a Scientist, individually responsible, will have attached my full name or initials.—H. W.]

TUESDAY, MAY 2, 1871.

WISHING TO MAKE THIS JOURNAL an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subject to which its colums are devoted, the publishers solicit letters from all among them who make the study of these subjects a pleasure, or a profession.

Subscribers would confer a favor upon us by remitting *CHECKS*, or *POST OFFICE MONEY ORDERS*, as we are frequent losers where money is enclosed in letters.

☞ NEWS AGENCY.—The American News Company, 119 and 121 Nassau street, New York agents for this Journal. News dealers will please send orders to them.

NOTICE.

☞ *All Collections for Advertisements, Subscriptions, etc., are made directly from this Office. We have Agents to solicit the same, but they are not authorized to Receipt for Money.*

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In making remittances for subscriptions, always procure a draft on New York, or a POST OFFICE MONEY ORDER, if possible. Where neither of these can be procured, send the money, but always in a REGISTERED LETTER. The registration fee has been reduced to fifteen cents, and the registration system has been found by the postal authorities to be virtually an absolute protection against losses by mail. ALL Postmasters are obliged to register letters whenever requested to po so.

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General Editorials.

THE QUESTION OF LEADEN WATER PIPES.

We are indebted to Prof. W. RIPLEY NICHOLS, of the Massachusetts INSTITUTE OF TECHNOLOGY, for a copy of a report made by him to the State Board of Health of Massachusetts, relating to this long vexed sanitary question. Professor NICHOLS, besides having thoroughly examined the literature of the subject, has made new experiments and analyses. Some of his results and conclusions may be condensed as follows: *Pure* water, in the absence of air, has no action on lead. Rain and distilled water act immediately and violently, the action being due chiefly to *nitrites*, especially nitrite of ammonia, with formation of a lead compound which is however almost immediately converted into carbonate or oxycarbonate. In all natural waters lead suffers corrosion to a greater or less extent, and we cannot say, *a priori*, whether a given water will act slightly or violently. It is generally agreed that the influence of sulphates, phosphates and carbonates is protective. In presenting Professor NICHOLS's analytical results, we have taken some trouble to reduce them all to the same standard, of the number of parts of metallic lead in *ten million*. We premise that FRESENIUS found sulphate of lead soluble in 20,000 and carbonate in 50,000 of cold water, while the phosphate is absolutely insoluble.

	In ten million parts.
1. Cochituate water from the Lake	0
2. Boston Common; drinking fountain	4
3. Delivered through 100 feet tin-lined, and 12 feet lead pipe	3½
4. Same as last, through lead tank, 50 ft. lead pipe and copper boiler (*hot water*)	20
5. After 14 hours, in 150 ft. old lead pipe	10
6. Same as last, after running freely	3
7. After 4 hours in 50 feet of entirely new pipes	7
8. After 4 months in entirely new pipes	9
9. Mystic Water, Charlestown, after two months in 50 feet lead pipe	12
19. Mystic Water, Charlestown, after two months in 50 feet lead pipe	12
Solubility of sulphate of lead	500
" " carbonate "	200
" " hydr. oxide "	1000

The mean of six of the most practically applicable of the above results, Nos. 2, 3, 5, 6, 7, and 10, give us 6½ parts, which is equal, in case of a person imbibing an average of two quarts of liquid per day, to the ingestion, *in one year*, of about *seven grains of lead*. This is not very alarming, so far as it goes.

Apropos to this subject, we find an interesting Editorial in the last (April) No. of the *Jour. of the Franklin Institute* which we should like to condense, and follow up this important subject at some length; but find it necessary to defer this to another occasion. H. W.

THE SCIENTIFIC COURSE AT THE STEVENS INSTITUTE.

We have already repeatedly referred to these splendid scientific lectures, which, in the way of uniting the attractive with the instructive, are beyond comparison with any similar entertainment heretofore provided for the citizens of the great metropolis. The Peabody Course of President MORTON, of which we have had so fine an illustrated report, will serve as an example of the character of the whole. The thanks of our community are emphatically due to the Trustees of the new Institution for their liberality in authorizing, and to the President for his assiduity in organizing this Course. We had the pleasure ourselves of listening to the eloquent effort last week of Prof. SILLIMAN, "On the Chemistry of the Atmosphere," in which great gratification we participated with an overflowing audience. Indeed the capacious lecture room has on all these occasions been filled to overflowing with appreciative audiences, in contradiction to the tradition coming much into vogue in this country of late, that popular expositions of scientific subjects are losing their interest for the million.

Among the greatest attractions of this course will be a series upon a subject not often heretofore treated in this illustrative way in this country, and which will therefore possess, even for those of us who have claims to scientific culture, the additional element of much novelty. This is a series, by Dr. J. SOLIS-COHEN, of Philadelphia, on "SOUND."

In a conversation with this gentleman, who is in possession of some most exquisite acoustic apparatus, we have learned the scope of the course at greater length than can be read in the general pamphlet Synopsis that has been distributed, and can therefore give our readers a brief *resume* of the proposed course.

The first Lecture is entitled "The Physical Phenomena of Sound," will be delivered on May 11th, and will be more elementary than the others.

Sound will be explained as a form of motion perceived by special organs of sense and those only; the form of motion being a vibratory one, repeating itself many times a second, the pitch or acuteness of the sound being higher the greater the number ot these repetitions in a given time.

The physical distinction between music and noise, will be shown to exist only in the regularity or irregularity of these repetitions of vibratory movement; and by rendering the successions of noise periodic, they will be converted into music. Experiments with a toothed wheel, TREVYLAN'S bar and rocker, the trembler of the galvano-magnetic apparatus, HELMHOLTZ double siren, and immense singing flames,* will be performed before the audience in illustration of this fact. Stretched strings, rods of metal and of wood, immense tuning forks, bells, tumblers, organ pipes, and other instruments yielding sound, will all be shown to owe this power to the same cause.

Experiments with tuning rorks, organ pipes, and singing flames, will be employed to show the phenomena of interference of sounds, and explain the production of beats. Resonance or reinforcement of sound will lead us to the consideration of echoes; and in illustration of the propagation and conduction of sound, we are to have some (apparently) *Speaking Heads*, and a Telephonic Concert. We shall refer in our next to the remaining three lectures of this course, having no space in this. H. W.

**Singing Flames.*—We commend these illustrations even to the attention of our most practical readers among the gas fraternity, as relating to principles and phenomena of high importance, as well of interest. H. W.

TRIANGULAR TRUSSED WROUGHT IRON TOWER, FOR GASHOLDER SUSPENSION FRAME.

We understand that Mr. John J. Kennedy, of Hoy, Kennedy & Co., of this city have patented a triangular trussed wrought iron tower for gasholder suspension frame, and are now building a number of them. They are said to be highly approved of by all the gas fraternity who have seen his plan and are a decided advance in strength, beauty and economy of construction.

Mr. John P. Kennedy has a world wide reputation as a gas works engineer and constructor, having erected and started many of the largest gas works in this country. The last works finished by him was the Citizens, of Newark, N. J., a visit to which will repay our readers interested in gas works. He is now erecting the works of the Mutual Gas-Light Company of New York, at Eleventh street East River.

An illustration with full description of the above will shortly be laid before our readers.

L'INDUSTRIALE; for March 6, 1871; a new Journal devoted to the advancement of the National Industries of Italy, published by CANTONI MACKENZIE & Co., at Milan, reaches us with request for exchange, etc. We publish their letter on another page. Such a "live Journal" as this, should be subject of congratulation to all the friends of Italy. In the columns of this issue we find valuable original articles on the Bleaching of Tissues of Flax; the Making of Gas from Crude Petroleum (with large lithograph plate illustrations); and a multitude of other articles and items of value to all interested in the arts of civilization. We most heartily extend the right hand of fellowship to our youthful but vigorous *confrere*, across the wilderness of waves that divides us.

GAS WORKS FOR SALE.—Attention is called to the advertisement on page 137 of a gas works for sale. We do not hesitate to say that as a speculative investment, it affords an excellent chance; and for those who would give it their personal attention, it is a rare opportunity to engage in a lucrative occupation, capable of being extended. The terms, which are liberal, and other particulars, may be learned by applying at the office of this Journal.

SOUTHWARK FOUNDRY.—The attention of gas companies is directed to the advertisement of Henry G. Morris, successor to Merrick & Sons. This foundry is the oldest in this country having been established since 1836. The facilities afforded by this extensive works, together with the long experience of Mr. Robert Briggs, Superintendent, enables Mr. Morris, to fill all orders with only first-class materials, and it is to be hoped, he will receive the patronage of gas companies.

Report of the Bath (Me.) Gas-Light Co.

In our publication of the annual report of the above Company, on the 3rd ultimo, some mistakes occurred in the last paragraph, which we herewith republish:

"We have carbonized 776,000 pounds of Provincial and Westmoreland gas coals—making per station meter 2,904,970 cubic feet of gas; have delivered to consumers 2,649,252 cubic feet. Allowing for the quantity remaining in gas holder 15,000 feet, and 10,000 feet used at the works, leaves 230,718 feet for condensation and waste, about 9¼ per cent. We have 272 consumers, 32 street lamps, and about three miles of street mains."

Answers to Correspondents.

X. of New York.—We have made it a rule not to insert any communication without having the author's name and address in full—not necessarily for publication, but as a guarantee of good faith.

C. H. P. of N. J.—The effect you notice is altogether owing to a great portion of the pressure being removed. In the day time it is scarcely sufficient to give a steady flame.

J. H. J. of Ohio.—Hydrogen gas conducts both heat and electricity better than any other gas, resembling the metals in this respect.

A. S. of N. H.—Fifteen candle gas may be considered as doing very well. If you are sure you conduct your photometrical experiments with care, and are accurate in your determination, your mixture of coal is judiciously made.

FOR SALE.

Purifiers, Condenser and Station Meter.

The RONDOUT AND KINGSTON GAS-LIGHT COMPANY being about to enlarge their Works, offer for sale their present Purifying, Working and Condensing Apparatus, with Station Meter, as follows: Washer 7 feet high, 20 inches diameter, with 6-inch inlet and outlet; six 12-inch Condensers, with 3-inch air pipes; four Purifying Boxes, 5 feet diameter, with Covers and Centre Seal, in complete working order; all with 6-inch inlets and outlets. This apparatus is capable of washing, condensing and purifying 50,000 feet of gas per day. Station Meter made by SAMUEL DOWN, four feet by four feet, with clock and tell-tale.

The above apparatus will be ready for delivery about July 1st, and will be sold on reasonable terms. For further particulars apply to W. H. TURNER, Sup't,
242-tf Rondout, N. Y.

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A VALUABLE **GAS COAL PROPERTY,** IN CLOSE proximity to the Despard Mines, near Clarksburg, in West Virginia. It contains 1000 acres, with a seven foot vein underlying the whole property; surface heavily wooded; the mines opened, and all the necessary machinery on the premises for immediate operations. It binds both sides of the Baltimore and Ohio Railroad, and possesses advantages for economical shipment; superior to any Coal Mine in the State. The coal is of superior quality, yielding a high test, as shown by the Manhattan and other gas companies. Good frame buildings on the premises for hands, etc. Will be sold low for cash, or exchanged for city or country property. Apply to J. G. SALVA, 58 Broadway, Room 25, or at the office of this Journal. 242-6t

GAS PURIFICATION.

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Has purified, per bushel, on a single test, 10,000 feet of Westmoreland Gas. With revivification lasts indefinitely. Surpasses in POWER and ECONOMY all known materials. Saves largely in FIRST COST, SPACE, LABOR, SUPERINTENDENCE, and all current expenses. Will purify *easily* sulphurous gas, wholly *unmanageable by lime.* Takes out *all the ammonia.* Now operating in the following Gas Works: Harlem; New York (21st street); Port Morris; Hunter's Point; East New York; Worcester, Lynn and Cambridge, Mass.; Lewiston, Maine; St. Albans, Vt.; Pawtucket, R. I.; Meriden, Ct., and being introduced in many other places.

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☞ Immediate arrangements are urged, as the demand for the prepared composition is increasing *so rapidly* that delays in supply may occur.

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(Prof. W. makes a specialty of GAS CHEMISTRY, and the Analysis of Gas and Coals. Formerly Chemical Examiner in the U. S. Patent Office Practices as

Counsel, and Adviser

of INVENTORS, in all the CHEMICAL ARTS; for which his great general experience in these Arts, and his special experience inside the Patent Office, have qualified him to an unparalleled degree.

Prof. WURTZ is Editor of the AMERICAN GAS-LIGHT JOURNAL AND CHEMICAL REPERTORY, a journal whose circulation and patronage is among classes of the community of the highest position, influence and enterprise; and which furnishes therefore an unequalled medium for communication to the general public, of valuable inventions and novel enterprises.

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241-1y **St. Louis, Mo.**

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Further particulars can be had by addressing the Editor of this Journal. 241-tf

AGENCY FOR

GIBSON'S IMPROVEMENT

IN THE

Manufacture of Coal Gas,

42 PINE STREET, ROOM 18.

The undersigned having been appointed Special Agent for the introduction of GIBSON'S Substitute for Dip-Pipes in the Manufacture of Coal Gas, respectfully presents for the consideration of Gas-Light Companies the Circulars and Pamphlet issued by the American Coal Gas-Light Imp. Co., descriptive of the value of GIBSON'S Improvement, and the mode by which Gas-Light Companies can satisfy themselves of its usefulness, without trouble or expense, at their own works.

Orders for fitting up Valves of any desired form or patent, *subject to the generality of the Gibson claim*, and also for SUPPLIES and MATERIALS of every description required for the use of Gas Light Companies promptly attended to by

W. H. GRENELLE, Special Agent

REFERENCE.—RICHARD MERRIFIELD, ESQ., late Vice President MANHATTAN GAS-LIGHT COMPANY.

GRAHAMITE,

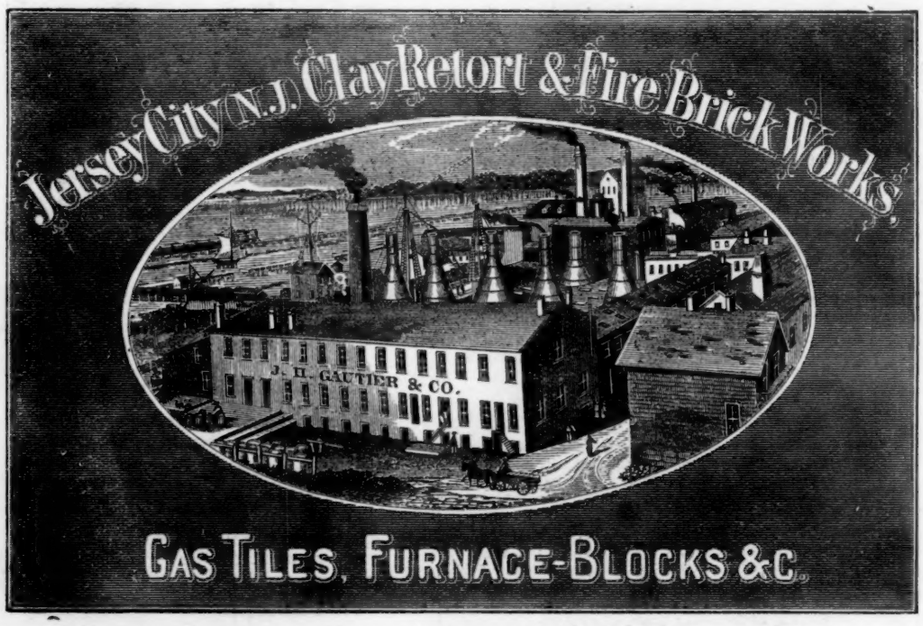
OR

RITCHIE MINERAL.

This Asphalt, after the severest tests and comparisons has been adopted, and is largely used by the principal Gas-Light Companies, and will be furnished by the Company at rates far below its intrinsic value. Its yield is 15,000 cubic feet per ton of 32 Candle Gas, as repeatedly established by the Manhattan Gas-Light Company and the Philadelphia City Gas Works, which is *four times* the value of ordinary Gas Coals.

Our vein being near the Ohio River, affords facilities for Western transportation. One bushel Lime purifies 6000 feet. Coke 26 bushels per ton—"very good." Proportion usually required for enrichment, five per cent.

The Ritchie Mineral Resin and Oil Co.
7-6m No. 27 South Charles Street, Baltimore.



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This invention consists mainly in dispensing with the interior gas pipe, by simply closing the bottom of the Lamp Post and tapping it five inches from the bottom for the service pipe.

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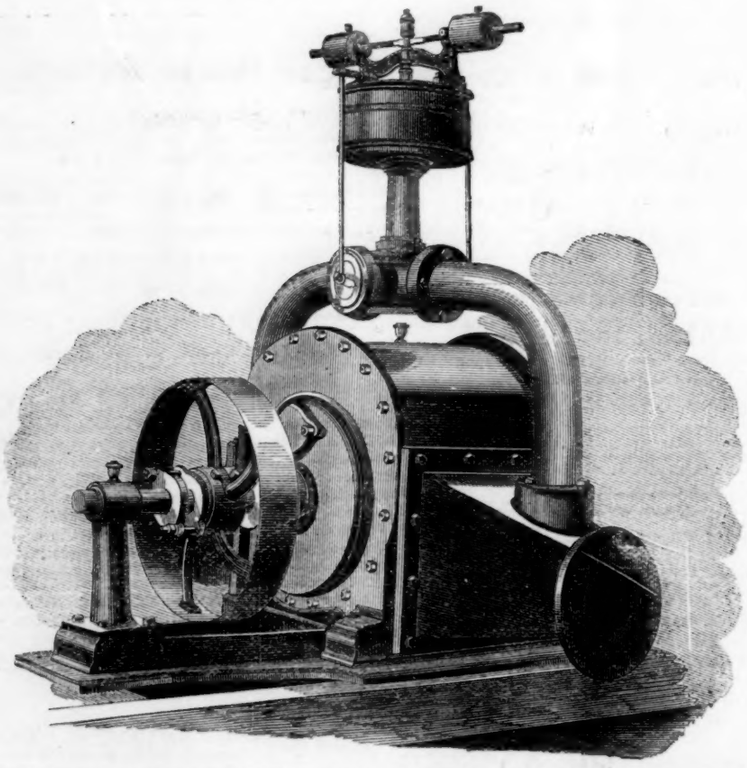
And Patent Compensator.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

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The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent fuel. Address

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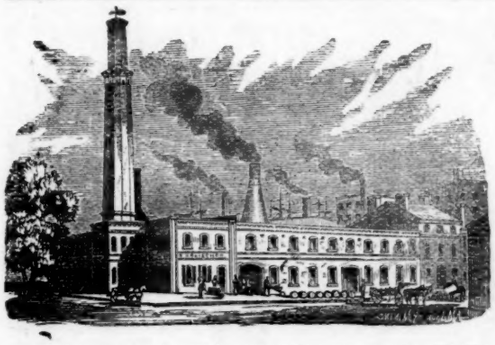

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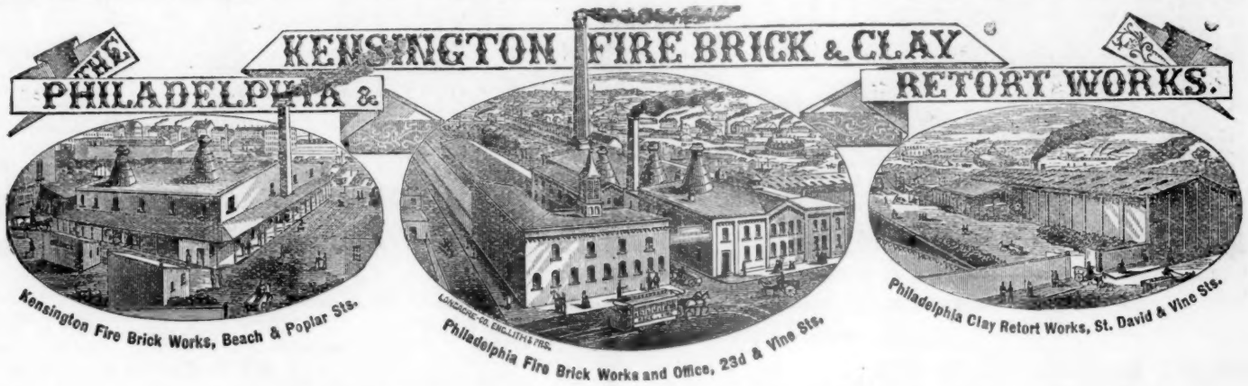

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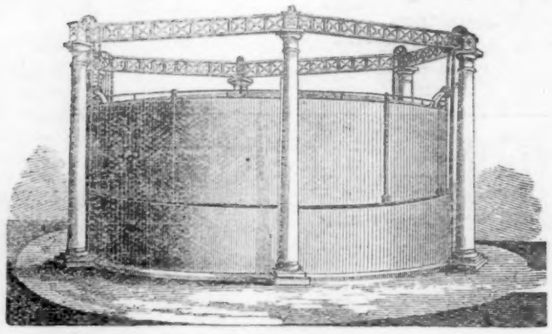

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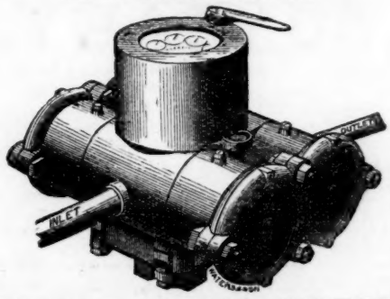

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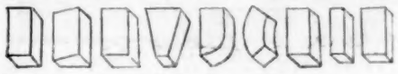

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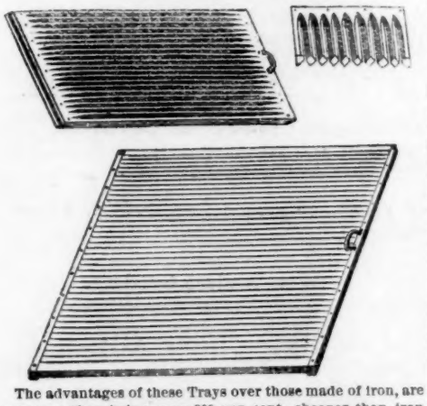

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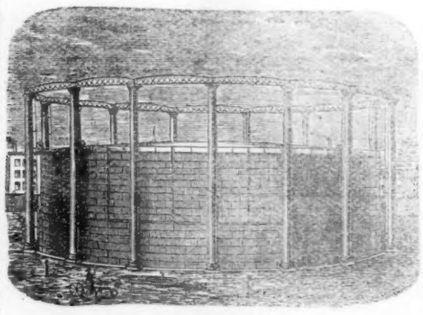

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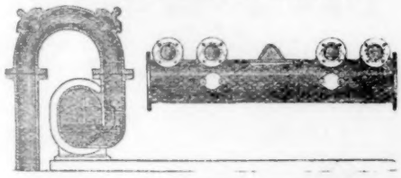

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THE AMERICAN METER COMPANY.

Organized under the General Manufacturing Laws of the State of New-York.

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This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS AND REGISTERS, SERVICE and METER COCKS, and all articles in their line appertaining to the use of Gas Works.

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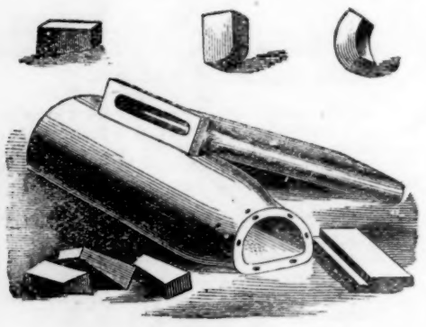

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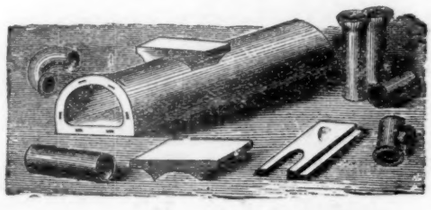

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Retorts of the various sizes kept on hand.

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Continue as heretofore at the OLD ESTABLISHMENT, Nos. 1115 and 1117 Cherry Street, Philadelphia, Pa.,

To manufacture Wet and Dry Gas Meters, Station Meters, Experimental Meters, Meter Provers, Centre Seals, Governors, Pressure Registers, Indicators, Photometers, and all kinds of Gas Apparatus; Also furnish all other Articles appertaining to the use of Gas Works.

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WROUGHT IRON ROOFS,
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COKE BARROWS, AND ALL WROUGHT
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Particular attention paid to the Extension of Works and Repairs to Gasholders, Purifiers, Etc.; also, Builders of Water Tanks, Oil Stills, Etc.

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Benjamin Acton, Salem Gas Co., N. J.
D. H. Smith, Watkins Gas Co., Watkins, N. Y.
W. F. Warner, Oswego Gas Co., N. Y.
E. Wilcox, Joliet Gas Co., Ill.
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PREMIUM GAS STOVES,

New, Cheap, Clean, Simple and Healthful. No oder, no Dirt, no Soot, no Ashes, no Coal Box, no Punching and Renewing Fire.

The Cambridge Gas Stove.

This truly scientific invention received the premium at the State Fair at St. Louis, and is being introduced at the West and also in the New England States, with great success. Certificates of its excellence and superiority from some of our most scientific and influential men are voluntarily given, and will be furnished upon application.

These stoves may be seen in operation at No. 42 Pine street, Room 18, where information may be obtained.

Worthington's Steam Pump,

Extensively used by

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For sale at greatly reduced prices. Also, a new and highly successful PUMP, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES for Water and Stem-stops.

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Cast Iron Pipes and Fittings.

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GAS AND WATER MAINS.

All sizes from 3 to 30 inch cast vertically in 12½ feet lengths

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The Aubin Balanced

VALVE WATER METER,

(Used also for Oils and Liquors.)

Is now in use by many city water companies, because of its Low PRICE, Simplicity, Durability, Accuracy under any pressure, and, (a great advantage) because it runs with less head than any other meter used.

Manufactured by H. Q. HAWLEY, Albany, N. Y.

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SUCCESSORS TO

WYCKOFF, BROS. & CO.,

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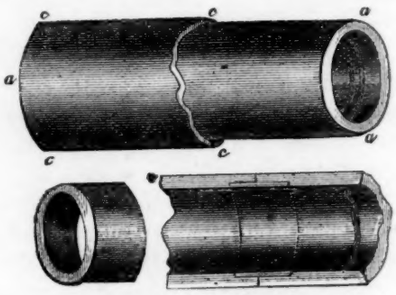
Manufacturers of Wyckoff's Patent Imperishable

Wooden Water & Gas Pipe.



These Pipes combine

Strength, Durability and Economy.

The Water Pipes are the Cheapest and best in use for watering Cities and Villages, conveying water to Railroad Tanks, Distilleries, Breweries, Tanneries, and water courses of every description.

Wyckoff's Patent Gas Pipe is less expensive than other kinds, more serviceable and more durable, being coated, inside and outside, with imperishable material, and impervious to air, gas or water, and warranted to give satisfaction. 219tf

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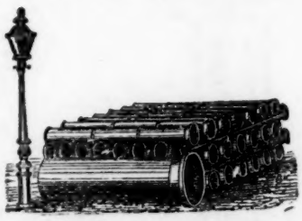

For the accommodation of parties who may want small lots Pipe for *immediate* delivery, we have established a yard in New York City.

We have on hand here several thousand feet of small Pipe, from which we can ship orders readily to any part of the country.

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3-tf SECOND FLOOR.

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Patent Gas Works.

JOHN BUTLER, Sole Manufacturer,

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OIL AND ROSIN GAS WORKS (all sizes) for Towns, Factories, Plantations, Churches, and Private Dwellings. These Works are warranted to make cheaper gas than any small Works known, and are very simple to manage. Refer to *over three hundred now in use from one to thirteen years.*

Estimates furnished for cost of Works, and the cost of manufacturing Gas in various localities.

Send for descriptive pamphlet.

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PLYMOUTH IRON WORKS,

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Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heay and Light Castings of every description.

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DENNIS LONG & CO.,

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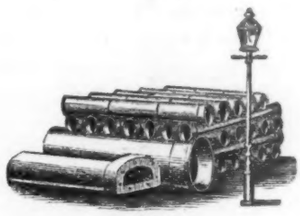

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Cast Iron Gas and Water Pipe,

All Pipe cast vertically in dry sand.

2 inch Pipes in 8 feet lengths. 3 inch to 60 inch cast in 12 feet lengths.

RETORTS AND MOUTH PIECES, LAMP POSTS, CONDENSING PIPE, HYDRAULIC MAINS, PURIFIERS, DRIPS, ELBOWS, T'S, CROSSES, SLEEVES, VALVES, &c., &c.

GAS-HOLDERS.

And every description of work necessary for Gas or Water Companies.

NATIONAL FOUNDRY

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OFFICE AND WORKS—CARROLL, PIKE, SMALLMAN AND WILKINS STREETS,

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WM. SMITH,

Manufacturer of all kinds of GAS and WATER PIPE, BRANCHES, CONNECTIONS, T's, ELBOWS, and all CASTINGS USED AT GAS AND WATER WORKS,

We offer special inducements to parties wishing to purchase. My Pipe is Smooth, regular in weights, and cast vertically.

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☞SEND FOR CIRCULAR AND PRICE LIST.☜

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MANUFACTURERS OF

ALL KINDS OF CASTINGS AND APPARATUS FOR GAS WORKS,

WROUGHT IRON ROOF FRAMES,

For Retort and other houses. Retorts and all castings required for setting them in the latest and most improved model. WASHERS, CONDENSERS, SCRUBBERS and EXHAUSTERS, for relieving the Retorts from pressure. PURIFIERS, varying from 2,000 to 2,000,000 cubic feet daily purifying capacity.

Wrought Iron Lime Sieves,

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GAS HOLDERS,

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With cast iron guide and suspension frames. GAS GOVERNORS or REGULATORS, STREET MAINS, from 1½ to 48 INCHES DIAMETER, for WATER or GAS. Street Main connections, such as BRANCHES, BENDS, DRIPS, SIEVES, etc.

STOP VALVES, from 3 to 30 inches, for both Water and Gas.

WROUGHT IRON WORK.

All the Smith and Sheet Iron work required in and about Gas Works. 226-tf

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THE DESPARD COAL COMPANY

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DESPARD COAL

To Gas Light Companies throughout the country.

Agents, PARMELEE BROTHERS, No. 82 Pine street, N. Y.

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Mines in Harrison County, West Virginia.

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Company's Office, 29 South street, }

Among the consumers of Despard Coal, we name: Manhattan Gas Light Company, New York; Metropolitan Gas Light Company, New York; Jersey City Gas Light Company, N. J.; Washington Gas Light Company; Portland Gas Light Company, Maine.

*** Reference to them is requested. 204-1y

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Castings for Gas Works

OF ALL DESCRIPTIONS

INCLUDING

PURIFIERS, EXHAUSTERS,

COMPENSATORS,

SELF-ACTING VALVES

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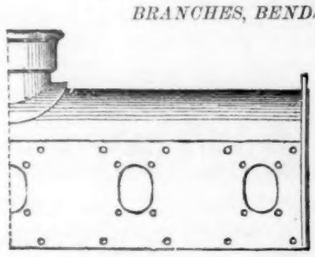

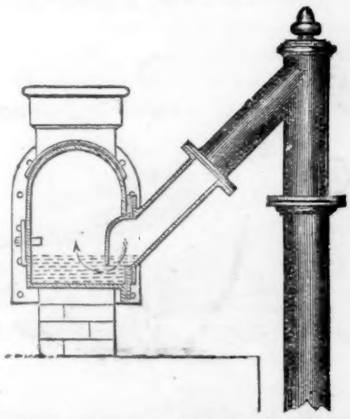

FLOYD'S PATENT ADJUSTABLE MAIN,

FOR BENCHES OF 1, 2, 3, 5 and 6 RETORTS.

By the removal of the front plate only the Main can be adopted to Settings of any number of Retorts desired. The Patent Main can be applied to the ordinary D shaped Main. It offers great facilities for cleaning, and is not liable to stoppage.

FLOYD'S PATENT

Malleable Iron Retort Lid.

SABATTON'S PATENT

FURNACE DOOR AND FRAME.

REFERS TO—J. A. Sabatton, Esq., Engineer Manhattan Gas Co.—Col. A. J. White, Metropolitan Gas Co.—C. C. Mowten, Engineer New York Gas Light Co.—J. Mowten Saunders, Engineer Baltimore Gas Co.—John T. Harrison, Engineer Savannah Gas Co.

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GAS HEATING AND COOKING APPARATUS,

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JOHN KEELING,

GAS ENGINEER,

Offers his service to Gas Companies, having had great experience in Europe, in all matters connected with the profession.

Special attention given to Retort setting.

The highest reference given. Address 42 Pine street, N. Y., office of this Journal.

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Patent Recording Pressure Gauges,

FOR STEAM, GAS AIR OR WATER.

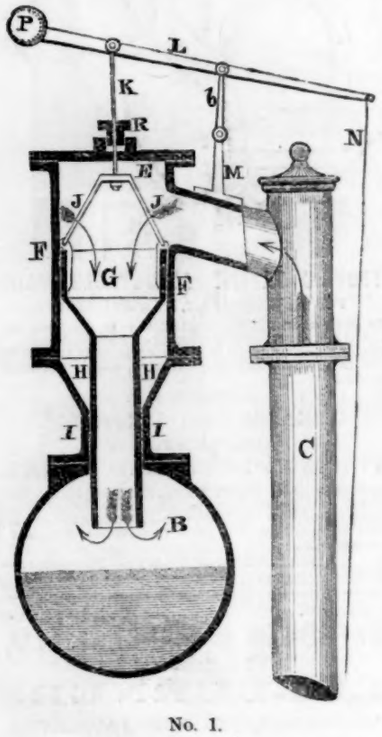
Send for Circulars to CHARLES G. WILLING, Manufacturer, 88 John street, New York, or D. P. DAVIS, 44 Courtlandt street, New York. 8-3m

DOUTY'S

PATENT UNSEALING DIP-PIPE.

COLUMBUS, OHIO.

Dear Sir: The great disadvantage and inconvenience of the accumulation or deposit of carbon in Retorts in the manufacture of illuminating gas from coal or any hydro-carbon, has long been felt by all gas companies, and it is admitted by all that the deposit is a great waste of the richest portion of the coal. The deposit is beyond all question formed by what is generally called "back pressure," or, in other words, in the gas not having an unobstructed flow from the retorts to and through the hydraulic main. In the present mode the dip-pipe to the main is sealed or immersed in the liquid from one to three inches, and thereby causes a very considerable portion of the obstruction for which an exhauster affords no remedy. My attention has for a long time been directed to a remedy for this great trouble to ALL gas works, and the annexed



No. 1.

cuts will show my method of doing away with ALL BACK pressure from the retort to the hydraulic main. It will be seen from an examination of the valves that there is NO RISK in its use, and if opened and closed as directed there is no obstruction in the least to the free flow of gas, and thereby preventing the accumulation of carbon, and therefore be of great advantage in the gas-making business. The value of this improvement to all the smaller class of gas works that cannot afford to work an exhauster must be apparent, and to larger works having an exhauster the improvement works to perfection, in relieving the retorts entirely of any pressure.

This improvement was patented January 31, 1871, and I take great pleasure in presenting it to engineers and superintendents of gas works. The cuts can be easily understood, and I should be pleased to furnish the valves ready to put on, or make liberal arrangements with any works for the right to use them. The improvement can be attached to any gas works, requiring little or no alteration of pipe, etc. These are manufactured by Morris, Tasker & Co., Pascal Iron Works, Philadelphia.

G. DOUTY, Superintendent.

The accompanying drawing represents a vertical cross-section of the hydraulic main, showing one of the dip-pipes unsealed, and its connection with the retort and the main, and in which—

A indicates a portion of the retort, which is connected to the hydraulic main B by the usual stand-pipe C and bridge D.

Instead of connecting the bridge D directly to the dip-pipe E, as heretofore, it is joined to and communicates with a chamber, F, secured to the hydraulic main, and which receives and entirely encloses the dip-pipe E, so as to allow it to rise and fall therein, to seal and unseal the main.

Another distinguishing feature of my invention consists in constructing the upper part of the dip-pipe with an enlarged end, G, which, in connection with a corresponding construction of the enclosing chamber F, serves two useful and important functions: first, to form a ground-seat, H, to limit the descent of the dip-pipe; and, second, a sealing-joint between, the dip-pipe and the main, when the communication of the latter with the retort is cut off.

The lower part I of the enclosing chamber F forms a guide and bearing for the lower portion E of the dip-pipe, while the upper portion of said chamber is enlarged in diameter, and constitutes a guide to the upper portion of the dip-pipe, and between these two portions of the enclosing chamber the supporting and sealing-seat H and H' is arranged.

This ground-seat H H may be of any desired construction, but I prefer to make the ground-surfaces of the dip-pipe and the chamber which form the seat, oblique, as shown in the drawing.

This seat H' has the additional advantage of forming a lodgment for any gum and fatty matter which may rise in the enclosing chamber F, and thus assist in producing a tight joint when the dip-pipe is sealed, so that it is not necessary that the bearing-surfaces of the dip-pipe and enclosing chamber should fit accurately, thus obtaining the advantage of being enabled to raise and lower the dip-pipe without binding within its chamber.

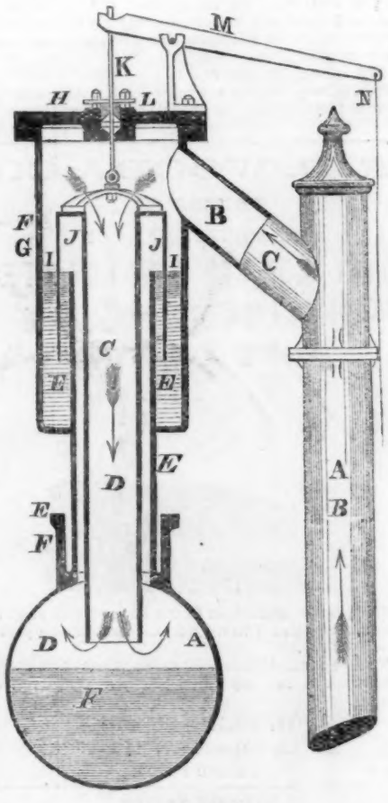
For convenience, the chamber is constructed in two sections, F and I, with the supporting and sealing-seat H' formed in the lower section, and by the use of this chamber I am enabled to employ a movable dip-pipe, which may be raised and lowered, to seal and unseal the main.

Both ends of this dip-pipe are open, and it is connected by a bale, J, and jointed stem, K, to a weighted lever, L, pivoted to an arm, M, rising from the bridge, D, and having a connecting rod, N, which, when connected with a hook, *a*, on the stand-pipe, C, elevates and unseals the dip-pipe, and when released from said hook, the weight P, together with that of the dip-pipe, forces down said pipe and seals the main.

The weighted lever L may be connected to the standard M, or to the stem K, of the dip-pipe, by links *b*, so as to allow the stem to pass through the stuffing-box R, at the upper end of the enclosing chamber F, without binding.

No. 2 is to answer the same purpose as No. 1, except that the dip-pipe has a water seal instead of a ground-joint seal.

The advantages of this means of unsealing the dip-pipe in the hydraulic main, will, I think,



No. 2.

commend itself to all gas engineers, as it is very simple and entirely safe, as there can no accident occur in case of the neglect of the fireman.

P. MUNZINGER'S TABLES,

Showing the flow of Gas per hour, under different Water Pressures, will be ready for distribution next month.

Gas Companies wishing a copy of the same will address,

MORRIS, TASKER & CO.,
Pascal Iron Works,
South Fifth and Tasker Streets,
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